



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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February 4, 2020

Catherine Jerrard
Program Manager/BEC
AFCEC/CIBW
706 Hangar Road
Rome, New York 13441

RE: Williams Air Force Base Task Order, Review of the Draft Soil Vapor Extraction System and Other Activities 2017 Annual Performance Report, Former Liquid Fuels Storage Area Site ST012, Former Williams Air Force Base, Mesa, Arizona, December 2019

Dear Ms. Jerrard:

EPA has reviewed the Draft 2017 Annual Performance Report for the Soil Vapor Extraction(SVE) system and Enhanced Bioremediation (EBR) pilot study activities. We offer the following comments on the report.:

SPECIFIC COMMENTS

- 1. Section 2.2.1.1, SVE Vapor Sample Analysis, Page 2-14 and Table 2-7, Summary of SVE Gas Measurements, Page 2-14:** The text states that "O₂ [oxygen], CH₄ [methane], and CO₂ [carbon dioxide] data indicate that microbial activity, including volatile organic carbon [VOC] biodegradation, is occurring in the SVE [soil vapor extraction] treatment zone;" however, the text does not discuss how the data presented in Table 2-7 indicate that microbial processes are occurring. Rather, the text provides an overview of the gas measurements and does not explain how each gas relates to microbial activity. Additionally, the text does not discuss oxygen concentrations that exceed atmospheric conditions (20.95 percent [%] O₂) and how the oxygen content can be enriched when microbial activity typically depletes oxygen. Please revise the text to discuss how the gas measurements provided in Table 2-7 indicate that microbial activity is occurring in the SVE treatment zone. Additionally, please discuss how enriched oxygen conditions can exist when microbial activity is said to be occurring.
- 2. Section 2.2.1.2, SVE Process Monitoring, Page 2-18 and 2-19, and Appendix B, SVE System Monitoring Record, Calibration Tracking, PDF Pages 129-131:** Section 2.2.1.2 states that the quarterly average wellfield temperature ranged from 104.6 degrees Fahrenheit (°F) for the January through March 2017 reporting period to 119.5°F for the July through September 2017 reporting period; however, a calculation of average "Wellfield Air Temp" from the SVE System Monitoring Record in Appendix B (pdf pages 129-131) indicates that the averages should be 96.6°F for January through March 2017 (1/5/2017-3/30/2017) and 118.2°F for July through

September 2017 (7/6/2017-9/28/2017). Please revise the reported average wellfield temperatures in the text or clarify the source of the temperature ranges reported in Section 2.2.1.2.

3. **Section 2.3.2, Notable Trends, Page 2-35:** The text does not discuss trends in sufficient detail. While the text briefly discusses oxygen and methane trends, a discussion of carbon dioxide trends is missing. Additionally, the text does not explain why there are oxygen concentrations above 20.95% in several wells. The text should also discuss other factors, such as the range of temperature that is optimal for biological activity. Please revise the text to include a discussion regarding carbon dioxide data and the range of temperature that is optimal for biodegradation. Additionally, please provide additional information to support the statement that microbial activity is occurring in the SVE treatment zone and clarify how oxygen can exceed atmospheric conditions if microbial activity is occurring.
4. **Appendix K, Annual Groundwater Monitoring Report, Section 2.1, Groundwater Elevation Measurements and Well Inspections, Page 2-1:** Appendix K, Section 2.1 discusses TMP [temperature monitoring point]-01 and TMP-07 to justify high temperatures in the wells, but these temperature monitoring points are not shown on any figure. Figure 2-1, SVE and Monitoring Well Locations (PDF Page 76), in the main text, shows locations of TMP04, TMP05, TMP12, TMP13, and TMP15, but no other TMPs are presented on the figures. Please revise one or more figures to include the locations of all relevant TMPs, particularly those discussed in the text.
5. **Appendix K, Annual Groundwater Monitoring Report, Section 1.1, ST012 Background, and Section 3.1.2, LNAPL Measurements and Bailing/Removal Activities, Page 3-1:** The first sentence indicates that the presence of light non-aqueous phase liquid (LNAPL) was due to “regular monitoring and pumping of wells with LNAPL,” but according to Section 1.1, LNAPL presence has been attributed to the historical release of jet propulsion fuel grade four (JP-4) and aviation gasoline. Please revise the text to consistently attribute the presence of LNAPL at ST012 releases of JP-4 and aviation gasoline.
6. **Appendix K, Annual Groundwater Monitoring Report, Section 3.1.2, LNAPL Measurements and Bailing/Removal Activities, Page 3-2, and Table 3-2, ST012 LNAPL Detections and Volumes Bailed/Removed in 2017, 2016, 2015, 2014, 2013 and 2012, Page 3-9:** Section 3.1.2 states that Table 3-2 summarizes where light non-aqueous phase liquid (LNAPL) was encountered and the volume of LNAPL bailed and removed from 2012 through 2017, but information from 2017 is missing from Table 3-2. Additionally, the text and Table 3-2 do not report the same volume of LNAPL bailed/removed for 2016. The Text under the Year 2016 subtitle states that 377.5 gallons of LNAPL were removed but Table 3-2 states that 316.6 gallons were removed. Please revise Table 3-2 to include LNAPL detected and volumes bailed and removed in 2017. Additionally, please ensure the information for 2016 is consistent between Table 3-2 and the text.
7. **Appendix K, Annual Groundwater Monitoring Report, Section 3.3.2.4, Toluene Concentrations, Page 3-6, and Figure 3-8, ST012 LSZ Naphthalene Concentrations in Groundwater:** Section 3.3.2.4 discusses toluene results and changes from previous years, but the last sentence references Figure 3-8, which includes naphthalene results from 2017. Please revise Appendix K to include the missing toluene figure.
8. **Appendix K, Annual Groundwater Monitoring Report, Section 4.1.2.1, Benzene, Page, 4-2, and Section 4.2, Recommendations, Page 4-3 and 4-4:** Section 4.2 does not discuss how the

inferred benzene plume boundary will be addressed. While Section 4.1.2.1 states that migration upgradient is not expected, it is unclear from the text how the uncertainty associated with the western area of ST012 will be addressed. Additionally, the abandoned wells discussed in the bullet points should be added to Figure 3-7, ST012 LSZ Benzene Concentrations in Groundwater to support the statements in the text. Please revise the text to discuss how the uncertainty associated with the western extent of the benzene plume will be addressed and add the abandoned wells discussed in Section 4.1.2.1 to Figure 3-7.

9. **Appendix K, Annual Groundwater Monitoring Report, Figure 3-8, ST012 LSZ Naphthalene Concentrations in Groundwater, Section 4.1.2.3, Naphthalene, Page, 4-3, and Section 4.2, Recommendations, Page 4-3 and 4-4:** Figure 3-8 shows a dashed boundary line, indicating that the western extent of the naphthalene plume is undefined; however, this is not discussed in Section 4.1.2.3 nor in Section 4.2. Additionally, the abandoned well locations should be added to Figure 3-8, ST012 LSZ Naphthalene Concentrations in Groundwater, if the results were non-detect. Please revise the text to discuss the uncertainty of the western extent of the naphthalene plume and how this will be addressed. Additionally, please revise Figure 3-8 to include the abandoned well locations.

MINOR COMMENTS

1. **Figure 2-1, SVE and Monitoring Well Locations:** Figure 2-1 does not include a groundwater flow direction arrow. Please revise Figure 2-1 to include a groundwater flow direction arrow.
2. **Appendix K, Annual Groundwater Monitoring Report, Table 2-2, ST012 Groundwater Monitoring Analyses, Chemicals of Concern (COCs), and Chemicals of Potential Concern (COPCs) in Groundwater, Page 2-6:** The “Notes” section does not define the acronym “NAL” that appears in the 2-methylnaphthalene row. Please revise the “Notes” section to define the “NAL” acronym.

Thank you for the opportunity to comment on the report. Please call me at 415 972-3150 if you have any questions about these comments.

Sincerely,



Carolyn d'Almeida
Remedial Project Manager

cc: Wayne Miller, ADEQ
Ardis Dickey, AFCEC/CIB